REMARKS

This Response, filed in reply to the Office Action dated June 14, 2006, is believed to be fully responsive to each point of rejection raised therein. Accordingly, favorable reconsideration on the merits is respectfully requested.

The undersigned also gratefully acknowledges the courtesies extended by the Examiner in the interview of September 13, 2006.

During that interview, the pending claims were discussed in view of the cited art. In view of that discussion, Applicant respectfully requests that the rejection over the cited art be withdrawn for at least the following reasons.

Claims 1-23 remain pending in the application. Claims 1-3 and 5-23 have been rejected under 35 U.S.C. § 103 as being unpatentable over Kishida (previously of record) and newly cited Tamura (U.S.P. 5,517,333). Claim 4 has been rejected under 35 U.S.C. § 103 as being unpatentable over Kishida in view of Tamura and further in view of well-known prior art. Applicant submits the following arguments in traversal of the prior art rejections.

As an initial matter, the Examiner provides an extensive response in view of the comments previously filed. Applicant does not concede to any of the points of rebuttal, and would submit that the comments are moot in view of the new ground of rejection.

Applicant's invention relates to an image processing method and system to provide adequate image contrast. Detailed descriptions of the background and exemplary embodiment are set forth in the November 29, 2004 Amendment at pages 9-10. Applicant refers the Examiner to this description.

As previously discussed, Kishida teaches a set of reference tone curves which differ on a color by color basis. Col. 4, lines 38-42.

Turning to the newly cited art, Tamura relates to modifying preset gradation curves based on pixel values of the input image data. Referring to Fig. 5, curves Y1 and Y2 represent reference curves, and the curves a, b, and c represent modified curves. The modification of the reference curves will be determined according to input luminance value Y in relation to Y1 and Y2 according to formulas, such as $Y1/Y = (1/255^2 * (y-255)^3 + 255)/Y$, and $Y2=Y$. (Col. 8, lines 14-30). Based on the results, a modified curve becomes applied. Such modification may take on a form of a, b or c of Fig. 5 but will depend on the input image data. The luminance value Y is derived from a combination of R, G and B values. Col. 10, lines 46-47. Referring to Fig. 14, it is further noted that luminance data proceeds in parallel to both a low pass filter and gradation correction coefficients, such that any characteristic correction of luminance data (Y1, Y2) is done without regard to a filtered luminance.

The Examiner contends that the combination of Kishida and Tamura teach or suggest each feature of independent claim 1. The Examiner concedes that Kishida does not teach that basic preliminary stored characteristics relate to expression or compression and also does not teach low pass filtering. The Examiner cites Tamura to make up for this deficiency. Even assuming *arguendo* that the references can be combined, their combination does not teach each feature of claim 1.

The gradation correction characteristics Y1 and Y2 in Tamura allegedly disclosing the basic compression characteristics and basic expansion characteristics recited in claim 1 fail to

show input/output relationship of the luminance data subjected to low-pass filtering. Rather, the luminance data Y which has not been low-pass filtered is taken as an input as illustrated in Fig. 14 (First gradation correction characteristic circuit 1301 and Second gradation correction characteristic circuit 1302 in Fig. 14). In this regard, the gradation correction characteristics in Tamura are distinct from the basic compression characteristic and basic expansion characteristic in the present invention.

As illustrated in Fig. 4 of Tamura, the luminance signals Y are generated from image signals through Matrix circuit 101; based thereon, the luminance signals Y are sent to the feature quantity extraction circuit 102, the correction coefficient determination circuit 103, and the correction gain generation circuit 104 to finally provide Y'/Y; the image signals R, G, and B are multiplied by the resulting Y'/Y in the multipliers 107 to obtain the gradation-corrected signals R', G', and B'. At this time the luminance signal Y is low-pass filtered by LPF1305 to provide an average luminance Ya as shown in Fig. 14, while the correction gain generation circuit 104 outputs a correction coefficient, and the thus obtained average luminance Ya and correction coefficient are added by the adder 1303. According to the Examiner, this low-pass filtering for the luminance data Y by LPF1305 corresponds to the low-pass filtering for the luminance data generated from the image data as claimed in claim 1 of the present application (page 7, lines 10 to 12 in the Office Action). However, the luminance signals Y generated by Matrix circuit 101 shown in Fig. 4 are directly input into the gradation curves Yl and Y2 (col. 8, lines 14 to 17) which the Examiner alleges represent the basic compression characteristics and basic expansion characteristics of the input/output relationship, thus suggesting that the gradation curves Y1 and

Y2 do not represent the input/output relationship of the luminance data subjected to the **low-pass filtering**. By contrast, the claims include relationship of the characteristics as related to luminance data created from the image data and low pass filtered.

Morevoer, the average luminance Ya obtained by the low-pass filtering by LFF1305 alleged as the low-pass filtering in the present invention by the Examiner is processed and supplied to a weighted average circuit 1304 differently from through First gradation correction characteristic circuit 1301 and Second gradation correction characteristic circuit 1302 shown in Fig. 14. The weighted average circuit 1304 provides the correction gain Y'/Y by applying the signal X, which is a resultant from adding the correction coefficient output by the correction gain generation circuit 104 shown in Fig. 4 to the average luminance Ya in the adder 1303 (Tamura, col. 9, lines 8 to 9), into the formula (3) described in col. 8, line 5. Thereafter, as shown in Fig. 4, the respective R, G, and B signal data are multiplied by the correction gain Y'/Y in the multiplier 107 to provide the gradation-corrected data R', G' and B'.

Accordingly, while the luminance data Y is actually subjected to low-pass filtering as pointed out by the Examiner, the average luminance Ya subjected to low-pass filtering is not sent to be input as gradation correction characteristics Y1 and Y2, as shown in Fig. 14. In claim 1 in the present application, the basic compression characteristics and basic expansion characteristics are generated from image data and represent input/output relationship of the luminance data subjected to low-pass filtering. Thus, Tamura does not cure the deficiency of Kishida's disclosure.

Claim 1 describes multiple features in to the plurality of basic compression or basic expansion characteristics. As a first feature, the characteristic is prestored. As a second feature, the characteristic represents an <u>input/output relation between luminance</u> of the image data and low pass filtered. As a third feature, a selected characteristic is used to compress or expand the image data. No aspect of the combined teachings meets all three features of the claimed basic compression or expansion characteristic. For example, even in combination, the curves (Fig. 3) of Kishida and the curves (Fig. 5) of Tamura teach weighted modification from a baseline set of gradation curves. In Tamura, nether the reference curve Y1 nor Y2 is used. Therefore, the third feature (selected characteristic is used to compress or expand image data) is not met. In this regard, both Tamura and Kishida include the deficiencies of conventional gradation conversion which requires significant processing time to determine appropriate gradation conversion adjustments.

Applicant submits that no matter how broadly the Examiner construes the phrase "compression characteristic" or "expansion characteristic", neither Kishida nor Tamura teach use of a characteristic "thus selected" as recited in the claims. Rather, both Kishida and Tamura calculate a weight coefficient that generates a separate gradation characteristic unique to the image. Accordingly, none of the processing efficiencies of using a preliminary set of gradation characteristics and selecting therefrom can be accomplished.

Independent claims 7 and 10-12 are patentable for similar reasons, and the remaining claims are patentable based on their dependency.

With further regard to claims 16, 18 and 21, these claims describe cascading of the expansion and compression characteristics. The Examiner cites the addition of weighted correction equations for teaching this aspect of the claims. The result of the weighted sum is a single curve that retains none of the characteristics of the original reference curves. A cascade includes aspects of both curves in the cascade. Therefore, claims 16, 18 and 21 are patentable for this additional reason.

With regard to claim 20, as illustrated in Figs. 6A to 6D in the specification of the present application, an input value Yc (a predetermined level with respect to input values of luminance data) is given as a basis to divide into the upper level and the lower level. Claim 20 recites the characteristics defined by either a side of an upper level side or a lower level side of Ye. In this regard, the Examiner discusses upper and lower levels of the output density referring to Fig. 3, fl(x) and fd(x) in Kishida. That is, the Examiner merely discusses Kishida's description as to the functions on an upper level side and lower level side for an output such as fl(x) and fd(x), while claim 20 in the present application recites that the basic compression characteristics and basic expansion characteristics are defined on an upper level side and a lower level side for an input.

With further regard to claim 21, this claim describes the cascade relative to a predetermined level. To the extent that the Examiner contends that a sum of values is a cascade, there is no defining point of the cascade relative to a side of a predetermined level. Therefore, claim 21 is patentable for this additional reason.

With further regard to claim 22, this claim describes compression and expansion relative to an original size. The Examiner cites Kishida cols. 3 and 4 as teaching this feature. The cited portion at column 3 relates to a type of image (e.g. portrait or landscape) and not to original size. The cited portion at col. 4 teaches different weights for a background region and a main region. These would not depend on size but rather depend on the image data within those regions. See col. 3, last partial paragraph. The processing of data on an individual basis would eradicate any relation of the correction based on an original size. Accordingly, even assuming that the background and main regions are of different sizes, <u>there is no inherent relation of compression or expansion in relation to size</u>. Therefore, claim 22 is patentable for this additional reason.

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

RESPONSE UNDER 37 C.F.R. § 1.116
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